ACCESSION NR: AP4040771

brittle and break down during machining or sharp temperature changes. In the alloy with 33 at% iridium another phase, the δ'-phase, is formed. The alloy with 40% iridium consists of the δ'-phase alone, the microhardness of which is nearly 700 kg/mm^2. This phase is based apparently on the TiIr compound and is a high temperature modification of the δ-phase. The γ-phase has a Cr_3O-type cubic structure with a lattice constant of 5.00 kX; the δ'-phase has a CsCe-type structure with a lattice constant of 3.10 kX; the structure of the δ-phase could not be determined. Orig. art. has: 3 figures.

ASSOCIATION: Insty*tut metalokeramiki ta spetssplaviv AN URSR (Institute of Powder Metallurgy and Special Alloys, AN URSR)

SUBMITTED: 17Jun63   ATD PRESS: 3049   ENCL: 00

SUB CODE: MM, ML   NO REF SOV: 000   OTHER: 002

Card: 2/2

LUKASHENKO, G.M.; YEREMENKO, V.N.; SIDORKO, V.R.

Thermodynamic study of the system silver - antimony. Zhur.neorg.khim.
9 no.1:220-221 Ja '64.   (MIRA 17:2)

YEREMENKO, V.N.; LUKASHENKO, G.M.

Thermodynamic properties of magnesium antimonide. Zhur.
neorg. khim. 9 no.7:1552-1555 Jl '64.   (MIRA 17:9)

1. Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR.

ACCESSION NR: AP4021975

S/0073/64/030/002/0125/0132

AUTHOR: Yeremenko, V. N.; Nizhenko, V. I.

TITLE: Surface properties of liquid alloys based on nickel.
I.   The Ni-Sn-Al$_2$O$_3$ system.

SOURCE: Ukrainskiy khimicheskiy zhurnal, v. 30, no. 2, 1964, 125-132

TOPIC TAGS: liquid nickel alloy, nickel tin alloy, metalloceramics, surface property, surface tension, density, density temperature function, specific volume isotherm, nickel, surface tension temperature function, tin, surface active additive, Ni$_3$Sn, Ni$_3$Sn$_2$, capillary property, refractory, nickel tin alumina system, wetting ability, refractory wetting

ABSTRACT: Surface properties are very significant in the processing of metalloceramics. Experimental studies were therefore made of the surface properties of liquid alloys based on nickel at the interface with the gas phase and with the interface in contact with the surfaces of refractory materials. The density and its dependence on temperature of liquid alloys of the Ni-Sn system were determined. The specific volume isotherm of these alloys at 30 and 1500 C showed a significant

Card   1/3

ACCESSION NR: AP4021975

deviation from additive values. The density-temperature relationship of liquid Ni is approximated by the equation: $\rho = 7.78 - 0.0006(t-1453)$ gm/cm^3. The surface tension of Ni was determined in the 1500-1790 C temperature interval; the surface tension-temperature relationship is described by the equation: $\sigma = 1745 - 0.34$ (t-1500)erg/cm^2. For Sn the surface tension-temperature function is described by $\sigma = 510 - 0.092(t-800)$erg/cm^2. The surface tension at 1500 C of various alloys (including Ni$_3$Sn and Ni$_3$Sn$_2$) of the Ni-Sn system was also determined. The deviation of the surface tension-concentration isotherm from the isotherm for an ideal solution is explained by the retention, in the liquid state, of groups of atoms corresponding to the intermetallide Ni$_3$Sn. The effect of the addition of up to 1.0% Sn on the surface tension of Ni, and on its interphase tension at the interface with Al$_2$O$_3$ was investigated; Sn in small amounts is a surface active additive. The wetting of Al$_2$O$_3$ with liquid Ni-Sn alloys was determined by measuring the angle of contact on Al$_2$O$_3$. The capillary properties of these Ni-Sn Alloys was determined

Card 2/3

ACCESSION NR: AP4021975

by measuring the angle of contact on Al_2O_3. The capillary properties of these Ni-Sn alloys at 1500 C at the interface with Al_2O_3 were calculated. Orig. art. has: 7 figures, 1 table and 5 equations.

ASSOCIATION: Institut metallokeramiki i spetssplavov AN UkrSSR(Institute of Metalloceramics and Special Alloys, AN UkrSSR)

SUBMITTED: 25Oct62   DATE ACQ: 09Apr64   ENCL: 00

SUB CODE: ML, PH   NO. REF. SOV: 008   OTHER: 003

Card 3/3

TITLE: Thermodynamic properties of magnesium silicide $\mathcal{B}$

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 10, 1964, 2295-2296

ABSTRACT: Little-known thermodynamic properties of magnesium silicide

L 10014-65
ACCESSION NR: AP4044948

values were also calculated. The $\Delta H^?_{298}$ value was found to be in very good agreement with some of the previous data, but in sharp disagreement with certain others. The fact that there was a hint of negative value is emphasized. Fig. art. has

ASSOCIATION: Institut metallokeramiki i spetssplavov AN "krSSR (Institute of Powder Metallurgy and Special Alloys, AN 'kr SS

SUB CODE: MM, MT   NR REF SOV: 009   OTHER: 014

Card   2/2

... and in contaminated ... nitrogen and oxygen is described ...

TOPIC TAGS: silver, antimony, liquid metal, surface tension . . .

NO REP SOV: 072

SUB CODE: MM, MT
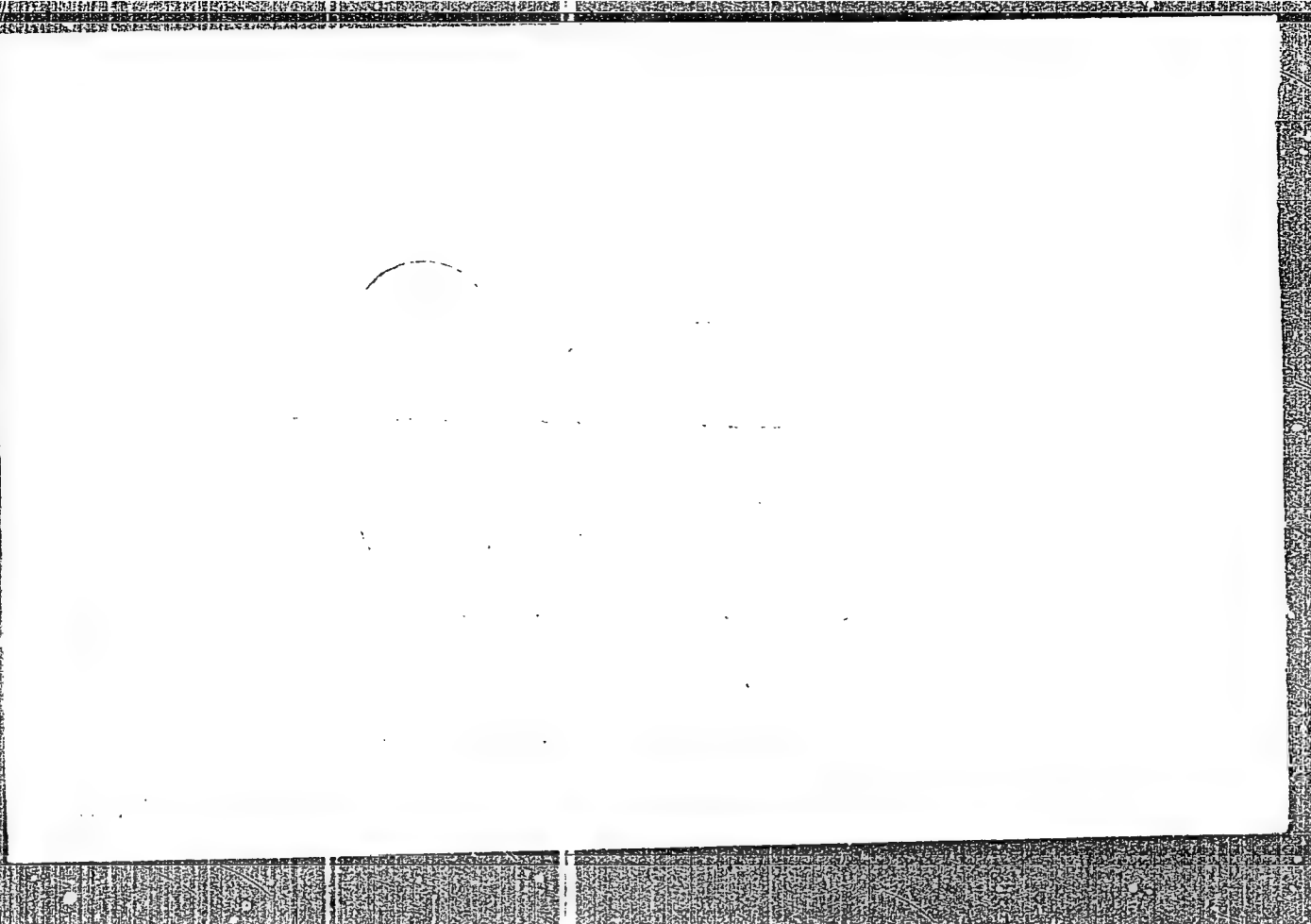
YEREMENKO, V.N.; LISTOVNICHIY, V.Ya.

Radiating capacity of the semispherical bottom of a cylindrical cavity.
Teplofiz. vys. temp. 3 no.2:234-237 Mr-Ap '65.   (MIRA 18:7)

1. Institut problem materialovedeniya AN UkrSSR.
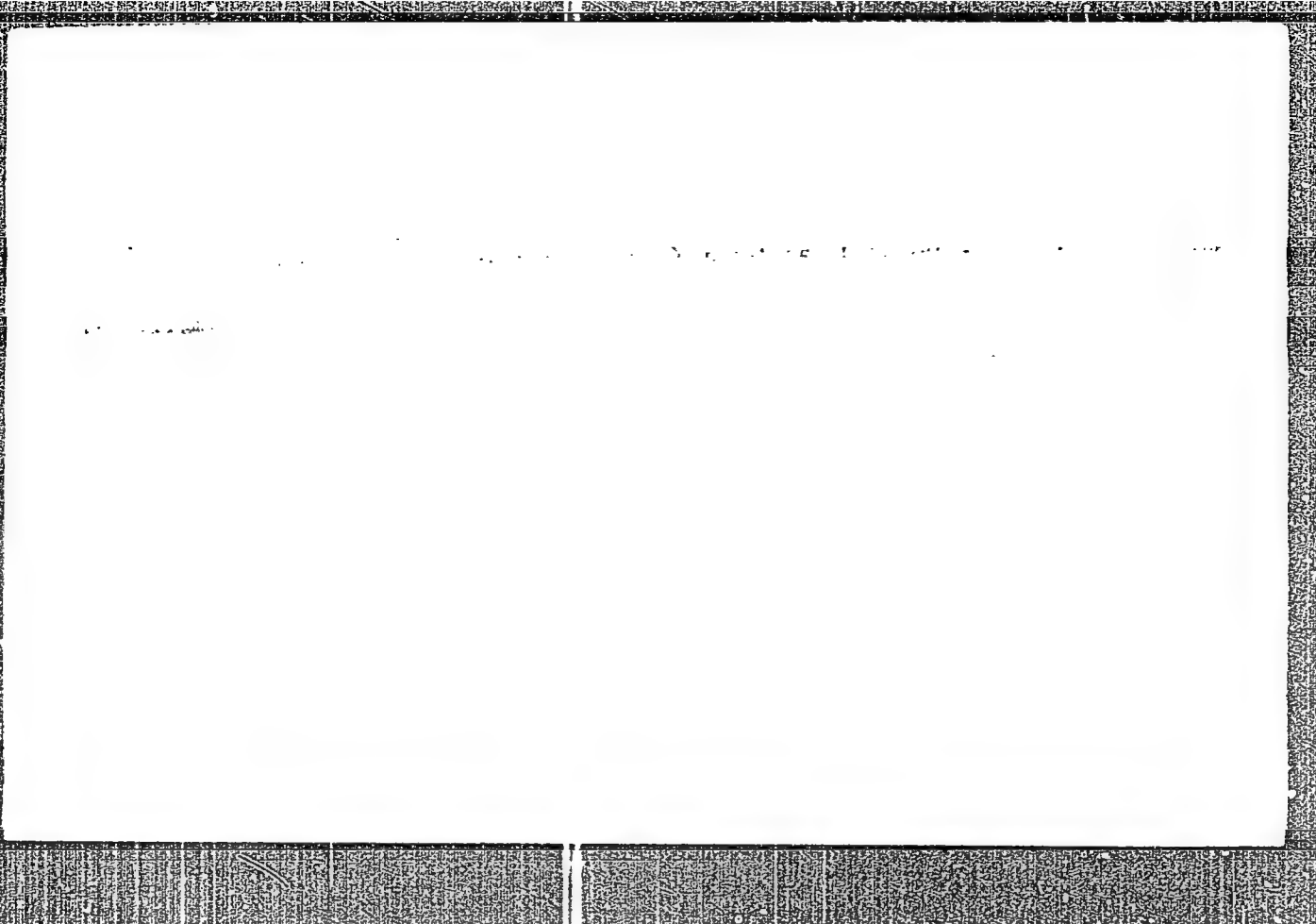
in clamps-current leads, are heated with joule heat. The solidus point is fix...

Card 2/2

AUTHOR

the time and temperature and was 83 deg at 1640C. In melts containing and
Card .

the composition   the contact zone and of solid

of the Mo base and the material - b
are shown of the liquids lying on the base. Using the appropriate angle of wetting,
surface free energies were obtained for pure Cu at 1120 and 1600°C, as well as for

NO REF SOV: 011   OTHER: 002

creases with increasing temperature. Which at all zirconium contents de-
free interphase energy of nickel at the nickel alloy... Zirconium reduces θ, sharply decreases the
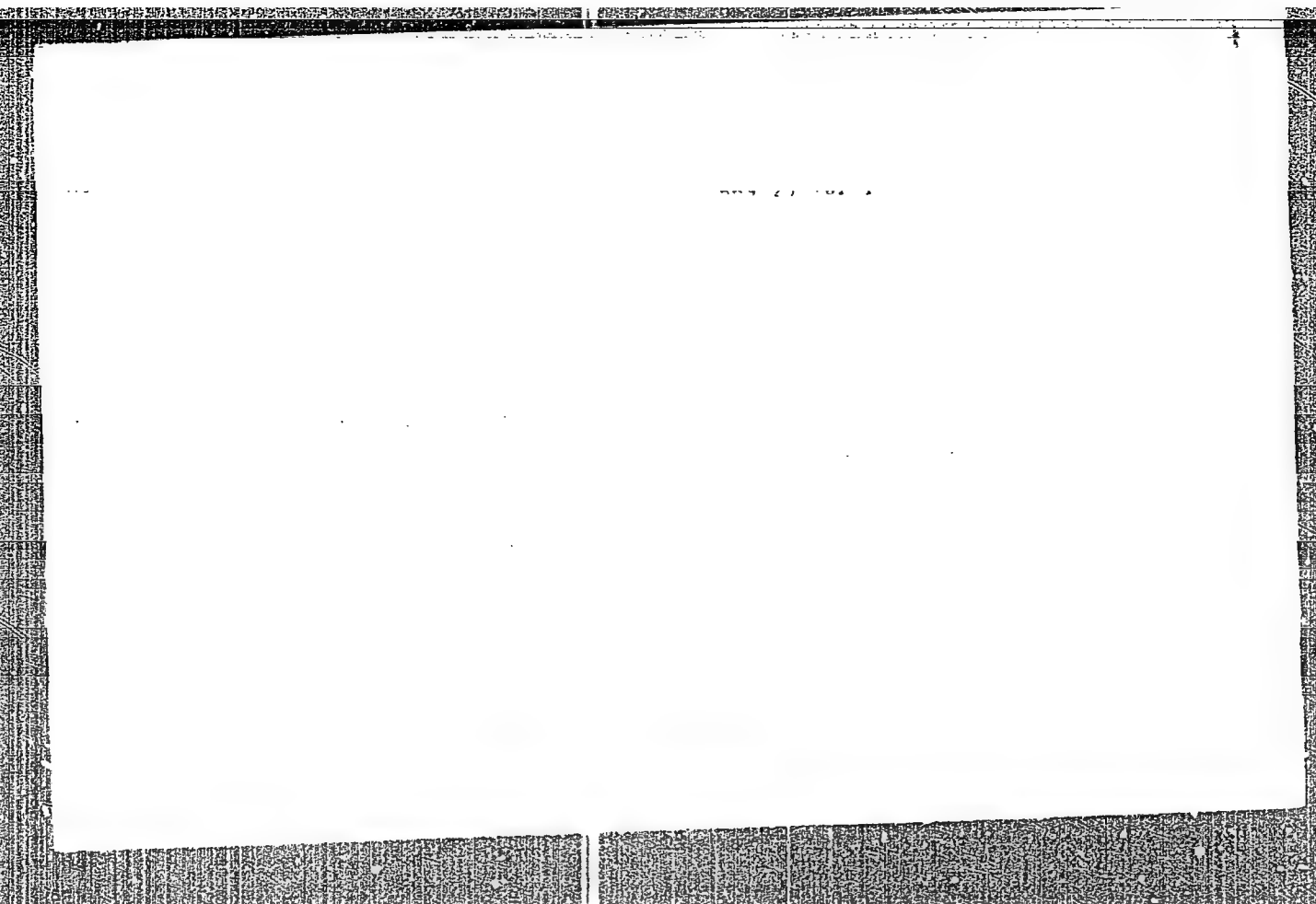
liquid gallium is not a linear function of temperature. After the least squares fit,
the data in the suitable time entered, ... equation is mil.

Card 2 .

gallium-alumina interface.   Intense chemisorption of liquid gallium on the alumina

Card 3/3

IVASHCHENKO, Yu.N.; YEREMENKO, V.N.; BOGATYRENKO, B.B.

Determination of the surface energy from the dimensions of a sessile drop. Zhur. fiz. khim. 39 no.2:516-519 F '65. (MIRA 18:4)

1. Kiyevskiy institut metallokeramiki.

YEREMENKO, V.N.; NIZHENKO, V.I.; SKLYARENKO, L.I.

Effect of zirconium on the surface properties of liquid nickel
at the interface melt – gas and melt – solid aluminum oxide.
Porosh. met. 5 no.7:80-83 Jl '65.   (MIRA 18:8)

1. Institut problem materialovedeniya AN UkrSSR.

TERESHENKO, V.N.; LUKASHENKO, G.M.; SIDORKO, V.R.

Thermodynamic properties of manganese silicides. Report No.2.
Porosh. met. 5 no.9:91-94 S '65.   (MIRA 18:9)

1. Institut problem materialovedeniya AN UkrSSR.

SAMSONOV, G.V., otv. red.; GRIGOR'YEVA, V.V., kand. tekhn. nauk,
        red.; YEREMENKO, V.N., red.; NAZARCHUK, T.N., kand. khim.
        nauk, red.; FEDORCHENKO, I.M., akademik, red.; PRANTSEVICH,
        I.N., akademik, red.; YAROTSKIY, V.D., red.; GILELAKH, V.I.,
        red.

        [High-temperature inorganic compounds] Vysokotemperaturnye
        neorganicheskie soedineniia. Kiev, Naukova dumka, 1965.
        471 p.   (MIRA 18:12)

        1. Akademiia nauk URSR, Kiev. Instytut problem materialoznavstva.
        2. Chlen-korrespondent AN Ukr.SSR (for Yeremenko, Samsonov).
        3. Akademiya nauk Ukr.SSR (for Fedorchenko, Frantsevich).

L 13802-66   EWT(m)/EWP(t)/EWP(b)   IJP(c)   JD

ACC NR: AP5024783   SOURCE CODE: UR/0021/65/000/009/1176/1179

AUTHOR: Yeremenko, V. N. (Corresponding member AN UkrSSR); Lystovnychyy,
V. Ye.--Listovnichly, V. Ye.

ORG: Institute of Problems of Study of Materials, AN UkrSSR (Instytut
problem materialoznavstva AN UkrSSR)

TITLE: Phase diagram of the titanium phosphorus system

SOURCE: AN UkrRSR. Dopovidi, no. 9, 1965, 1176-1179

TOPIC TAGS: phase diagram, ~~titanium phosphorus system~~, ~~binary system~~,
titanium, phosphorus, phosphide, physical chemistry property, ~~eutectic~~
~~reaction, peritectic reaction~~ solid mechanical property

ABSTRACT: A study was made to determine the interaction between titani-
um and phosphorus and a phase diagram was constructed for the Ti—P sys-
tem with up to 45 at% P. The existence of phases containing Ti_2P,
Ti_3P_2, Ti_4P_3, and phases Ti_3P, TiP in the Ti—P system was confirmed.
The physical and chemical properties of these compounds were determined.
Orig. art. has: 1 figure and 1 table. [Based on author's abstract].

SUB CODE: 11/   SUBM DATE: 10Oct64/   ORIG REF: 001/   OTH REF: 010

Card   1/1

L 15310-66   EWT(m)/EWP(t)/EWP(b)   IJP(c)   JW/JD

ACC NR: AP6001295   SOURCE CODE: UR/0363/65/001/008/1296/1297

AUTHOR: Yeremenko, V. N.; Lukashenko, G. M.

ORG: Institute of Materials Science Problems, Academy of Sciences UkrSSR (Institut problem materialovedeniya Akademii nauk UkrSSR)

TITLE: Thermodynamic properties of magnesium germanide

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 8, 1965, 1296-1297

TOPIC TAGS: magnesium compound, germanium compound, electromotive force, thermodynamic calculation, free energy, entropy, heat of formation

ABSTRACT: To study the thermodynamic properties of the compound Mg_2Ge, use was made of the method of electromotive forces. The emf of the galvanic concentration cell

$$Mg_s / KCl - LiCl - MgCl_2 / [Mg_2Ge + Ge]s$$

was measured in the 700–900K range. The alloys were prepared from 99.92% pure Mg and single-crystal germanium of semiconductor purity, and were subjected to preliminary annealing for 24 hr at 900K. Treatment of results by the least-squares method gave the following temperature dependence of the emf (in V):

$$E = 0.272 - 0.38 \times 10^{-4} \, T.$$

Card 1/2   UDC 546.46'289

L 15210-66
ACC NR: AP6001295

The temperature dependence of the standard free energy of formation of Mg_2Ge is described by the equation (in cal/mole)

$$\Delta F^O \; Mg_2Ge - 25100 + 3.5 \; T.$$

The standard heat and entropy of formation are respectively

$$\Delta H^O Mg_2Ge = -8.37 \; kcal/ \; g\text{-}at,$$

$$\Delta S^O Mg_2Ge = -1.17 \; cal/deg \; g\text{-}at.$$

Orig. art. has: 1 figure.

SUB CODE: 11 / SUBM DATE: 20Jan65 / ORIG REF: 005 / OTH REF: 001

Card 2/2

YEREMENKO, Vasiliy Nazarovich

[Organization of electric shearing of sheep; work practice of the
Baikadam Machine-tractor Station and the Kastek State Sheep Farm of
Dzambul Province] Organizatsiia rabot na elektrostrizhke ovets; iz
opyta roboty Baikadamskoi MTS i Kastekskogo ovtsesovkhoza Dzhambulskoi
oblasti. Alam-Ata, Kazakhskoe gos. izd-vo, 1956. 74 p.   (MIRA 10:2)
        (Dzambul Province--Sheep shearing)

YEREMENKO, Vladimir Nikolayevich; PANKOVA, V.M., red.; GOLICHENKOVA, A.A.,
tekhn. red.

[Builders of hydraulic structures; a narrative] Gidrostroiteli;
ocherk. [Moskva] Izd-vo VTsSPS [Profizdat," 1958. 126 p.
(Stalingrad Hydroelectric Power Station)   (MIRA 11:10)

YEREMENKO, V.S.

USSR/Chemical Technology – Chemical Products and Their Application.   Treatment of
                              Natural Gases and Petroleum. Motor Fuels. Lubricants,
                              I–13

Abst Journal: Referat Zhur – Khimiya, No 19, 1956, 62574

     Author: Khalif, A. L., Yeremenko, V. S.

 Institution: None

      Title: Development Trends of Gas-Gasoline Industry

    Original
  Periodical: Gazovaya prom-st', 1956, No 1, 36-40

    Abstract: Considered are the basic trends in utilization of associated gases
              of petroleum deposits and the new features introduced in the indus-
              trial methods of recovery of gas-gasoline and liquified gas by oil
              absorption, adsorption on solid adsorbents, low temperature con-
              densation and rectification.

Card 1/1

YEREMENKO, V.S.; POPOV, V.I.; KHALIF, A.L.

Natural-gas gasolines and their use. Gaz. prom. no.8:43-47 Ag '58.
(MIRA 11:8)

(Gasoline)

YEREMENKO, V.; POPOV, V.; KHALIF, A.

Production and utilization of natural gasoline in the United
States (from "Oil and Gas J.," no.47 1956, no.57 1957,
no.27 1958). Gaz. prom. no.9:52-53 S '58.   (MIRA 11:10)
                    (United States--Gasoline)

ALEKSANDROV, I.A.; CHITYACHENKO, V.S.; YEREMENKO, V.S.; KORTLYEV, Ya.P.;
FIALIF, A.L.

Obtaining liquefied gas in the refining of oil on the pressure
and vacuum distillation units of petroleum plants. Gaz. prom. 8
no.11:48-50 '63.   (MIRA 17:1)

YEREMENKO, V.S. (Kiiv)

Space stability of flat bridge arches [with summary in English].
Prykl. mekh. 3 no.1:75-85 '57.   (MLRA 10:5)

1. Kiivs'kiy inzhenerno-budivel'niy institut.
                    (Arches)

YEREMENKO, V.S. [IEremenko, V.S.] (Kiyev)

> Approximate equations of three-dimensional natural vibrations
> of arches connected by struts. Prykl.mekh. 8 no.2:191-199 '62.
> (MIRA 15:3)

> 1. Kiyevskiy inzhenerno-stroitel'skiy institut.
>   (Arches—Vibration)

YEREMENKO, V. S.: Master Tech Sci (diss) -- "The spatial stability of bridge arches with a suspension roadway and structure above the arches". Kiev, 1959. 17 pp (Min Higher Educ Ukr SSR, Kiev Construction Engineering Inst, Chair of Structural Mechanics), 200 copies (KL, No 13, 1959, 105)

YEREMENKO, V.S. [IEremenko, V.S.] (Kiyev); OBREMSKIY, S.V. [Obrems'kyi]
(Kiyev); PAVLOV, I.G. [Pavlov, I.H.] (Kiyev)

Design of a folded cyclically symmetric prismatic shell. Prykl.
mekh. 9 no.5:561-564 '63.   (MIRA 16:10)

1. Kiyevskiy inzhenerno-stroitel'nyy institut.

KORNOUKHOV, Nikolay Vasil'yevich, akademik; BELYANKIN, F.P., akademik,
otv. red.; STREL'BITSKAYA, A.I., doktor tekhn. nauk; AMIRO,
I.Ya., kand. tekhn. nauk, red.; DLUGACH, M.I., kand. tekhn.
red.; YEREMENKO, V.S., kand. tekhn. nauk, red.; NIKITIN,
Yu.P., kand. tekhn. nauk, red.; PAVLOV, I.G., kand. tekhn.
nauk, red.; POLYAKOV, P.S., kand. tekhn. nauk, red.;
KIYANITSA-GUSLISTAYA, N.N., mlad. nauchn. sotr., red.; ORLIK,
Ye.L., red.; LISOVETS, A.M., tekhn. red.

[Selected works on structural mechanics] Izbrannye trudy po
stroitel'noi mekhanike. Kiev, Izd-vo AN Ukr.SSR, 1963. 321 p.
(MIRA 17:2)

1. Akademiya nauk Ukr.SSR (for Kornoukhov, Belyankin).

YEREMENKO, V.S.; KHALIF, A.L.; KACHUR, O.Yu.

Foreign technology, Gaz. prom. 8 no.6:40-42 '63.
(MIRA 17:8)

DINER, G.G.; YEREMENKO, V.S.

Mechanical engineering study and practical work in school workshops.
Politekh. obuch. no.8:38-42 Ag '58.   (MIRA 11:9)

1.Srednyaya shkola No.20, g. Serov.
                    (Manual training)

Yeremenko, V.V.

USSR/Forestry - Forest Plants.   K-5

Abs Jour   : Ref Zhur - Biol., No 3, 1958, 10629

Author   : Yeremenko, V.V., Lavrov, N.A.
Inst   : -
Title   : An Experiment in the Development of Forest Protective Belts
               on the Kolkhoz imeni V.I. Lenin.

Orig Pub   : Lesn. kh-vo, 1957, No 7, 75-78.

Abstract   : No abstract.

Card 1/1

VYSHELESSKIY, A.N.; ZABOLOTSKIY, M.S.; YEREMENKO, V.V.; IMSHENETSKIY, A.A.;
    KOZIN, N.I.; KOZLOV, V.V.; LEDOVSKIKH, S.I.; LOBANOV, D.I.;
    MUNDRETSOVA, K.A.; RAZUMOV, A.S.; RAUTENSHTEYN, Ya.I.

F.M.Chistiakov; obituary. Mikrobiologiia 29 no.2:313 Mr-Ap '60.
                                                        (MIRA 14:7)
            (CHISTIAKOV, FEDOR MAKSIMOVICH, 1898-1959)

CHISTYAKOV, F., prof., doktor tekhn.nauk[deceased]; YEREMENKO, V. V.

Process of gelatinization of chilled meat. Mias.ind.SSSR
31 no.5:44-46 '60.   (MIRA 13:9)

1. Moskovskiy institut narodnogo khozyaystva im. Plekhanova
(for Yeremenko).
               (Meat—Bacteriology)

YEREMENKO, V.V.

Effect of low temperatures on the growth of cold-resistant bacteria and the process of their slime mold formation. Izv.vys.ucheb.zav.; pishch.tekh. 2:82-86 '62. (MIRA 15:5)

1. Moskovskiy institut narodnogo khozyaystva imeni G.V.Plekhanova, kafedra tovarovedeniya prodovol'stvennykh tovarov.
(Meat--Microbiology) (Cold storage--Hygienic aspects)

YEREMENKO, V.V.; KOVALENKO, V.N.

Specific plastic deformation as an index of the plasticity of
soils. Trudy SANIIRI no. 98:47-54 '59. (MIRA 14:1)
(Soil mechanics)

YEREMENKO, V.V., kand.tekhn.nauk; KHRULEV, V.M., kand.tekhn.nauk; STAVITSKAYA, L.M., inzh.

Using plastic coating on facing tiles manufactured from wood wastes. Der.prom. 9 no.9:16 S '60.   (MIRA 13:9)

1. Zapadnosibirskiy filial Akademii stroitel'stva i arkhitektury SSSR.
        (Wood, Compressed)   (Aminoplastics)

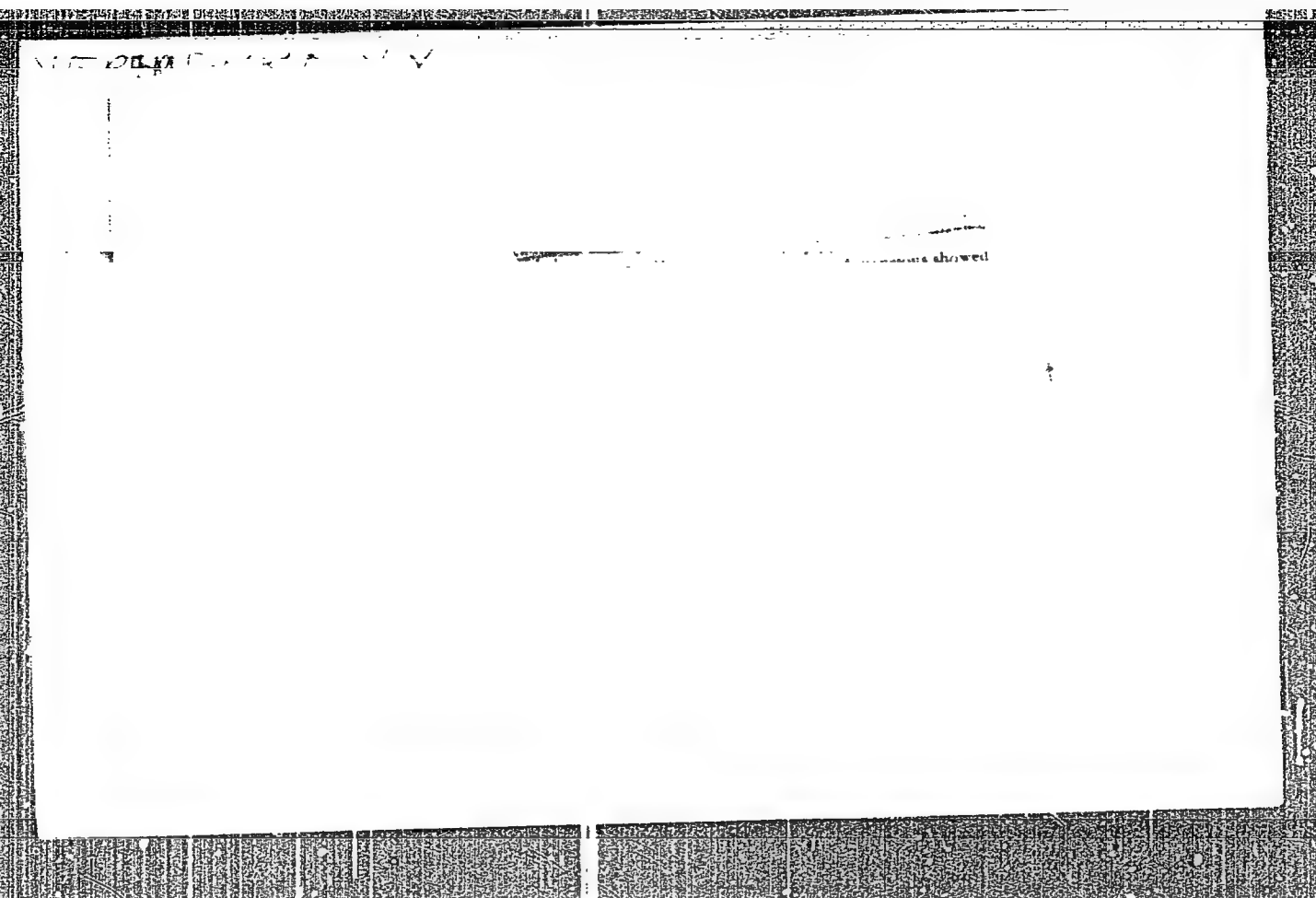YEREMENKO, V.V. [IEremenko, V.V.].

Luminescence of CdS crystals. Ukr. fiz. zhur. 2 no.4:382-383 O-D
'57.   (MIRA 11:3)

1. Institut fiziki AN URSR.
                    (Luminescence)   (Cadmium sulfide)

20-114- ?-19/60

AUTHORS: Broude, V. L., Yeremenko, V. V., Rashba, E. I.

TITLE: The Absorption of Light by CdS-Crystals (Pogloshcheniye sveta kristallami CdS)

ABSTRACT: The authors investigated the spectra of the monocrystals of the hexagonal modification of CdS at $20,4^\circ$K in polarized light. The samples were produced by evaporation of Cd and S in an argon-atmosphere, by evaporation of Cd in a $H_2S + H_2$-atmosphere and by evaporation of CdS (recrystallization). Samples with different boundaries and surface finish were investigated and the thickness of the samples varied between 1 and 100 . The spectra were investigated by a polarization-microprojector. Two components of the spectrum which correspond to the polarization of the light vector along the hexagonal axis and vertical to it were simultaneously fixed on the photo-plate by the use of a crystal or Iceland spar. The scheme of the absorption spectrum of the CdS-crystal in polarized light is illustrated by a diagram. The spectrum contains 10 rather narrow bands (in the interval $20400 - 20600$ cm^{-1}) and some

Card 1/3

20-114-3-19/60

The Absorption of Light by CdS-Crystals

wider bands over a continuous background. In the short-wave range at about 21100 cm^{-1} the continuous absorption begins. Striking is above all the weak polarization of the bands Nr 9 and Nr 10 which is distinctly to be noticed in both components of the spectrum. These two bands can only be connected with the absorption by the atoms of the layer near to the surface or with asymmetric defects. The second peculiarity is also important: The intensities of the bands from Nr 1 to Nr 10 as well as the polarization and the position of these bands in the spectrum can be different not only in different samples but also in different ranges of one and the same sample. Details of the behavior of the different bands are given. The luminescence spectra of CdS-monocrystals at a temperature of 20,4°K were also investigated; in this connect'on a green and also a blue luminescence were observed. The bands of this luminescence are probably in no connection with the exiton-states, but with electron-transitions near the defects. There are 1 figure and 7 references, 4 of which are Slavic.

ASSOCIATION: Institute for Physics AN Ukrainian SSR (Institut fiziki Aka-
Card 2/3   demii nauk USSR)

20-114-3-19/60

The Absorption of Light by CdS-Crystals

PRESENTED: January 7, 1957, by G. S. Landsberg, Member of the Academy
               (Deceased)

SUBMITTED: January 7, 1957

Card 3/3

YEREMENKO, V. V.: *Cand* Master Phys-Math Sci (diss) -- "Investigation of the optical and photoelectric properties of cadmium sulfide crystals at low temperatures".

Kiev, 1958.   14 pp (Acad Sci Ukr SSR, Inst of Physics), 150 copies (KL, No 6, 1959, 124)

YEREMENKO, V.V. [IEremenko, V.V.]

Absorption of polarized light by pyrene and chrysene single crystals
[in Ukrainian with summary in English]. Ukr. fiz. zhur. Supplement
to 3 no.1:49-55 '58.   (MIRA 11:6)
            (Pyrene--Spectra) (Chrysene--Spectra)

BROUDE, V.L.; YEREMENKO, V.V. [IEremenko, V.V.]; MEDVEDEV, V.S.;
PAKHOMOVA, O.S.; PRIKHOT'KO, A.F.

Effect of deformations on the electron spectra of crystals [in
Ukrainian with summary in English]. Ukr. fiz. zhur. 3 no.2:232-238
Mr-Ap '58.   (MIRA 11:6)

1.Institut fiziki URSR.
    (Crystals--Spectra)   (High pressure research)

YEREMENKO, V. V.

51-4 -3-10/30

AUTHOR: Yeremenko, V.V.

TITLE: Luminescence of Cadmium Sulphide Crystals.
            (Lyuninestsentsiya kristallov sul'fida kadmiya.)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol.IV, Nr.3,
            pp. 348-353 (USSR)

ABSTRACT: Luminescence was recorded on the side of a cadmium
            sulphide crystal plate opposite to that on which the
            exciting light fell. A glass spectrograph KS-55
            was used. Luminescence was excited by means of a
            mercury lamp. Crystals were cooled by means of
            liquid hydrogen or helium and measurements were made
            at 20°K. Monocrystals of CdS were grown by
            sublimation of powdered CdS or by synthesis of
            Cd and S vapours. Over 50 monocrystalline samples
            were studied. The luminescence spectrum was found to
            vary from sample to sample. Usually two regions were
            observed: a "green" and a "blue" one. "Green"
            luminescence is 100 cm^{-1} wide; "blue" luminescence
            consists of narrow lines overlapping with the absorption
            lines of a CdS crystal. In some samples intense
Card 1/3   orange luminescence was observed; in such samples the

51- 4 -3-10/30

Luminescence of Cadmium Sulphide Crystals.

"blue" luminescence was absent and the "green" was weak. Usually samples which had intense "blue" luminescence at 20°K had weak "green" luminescence and conversely. In the "green" spectrum $(19550-17500 \text{ cm}^{-1})$ two series of bands were observed. The stronger of these series begins at 19310 cm^{-1} and contains 5-6 bands. The second (weaker) series begins at 19500 cm^{-1} and contains 4-5 bands. Usually the first series was present and the second absent. The "green" luminescence was affected by treatment of crystal surface. New bands and changes in the relative intensities of bands were observed on etching in HCl. In the "blue" luminescence 12 bands were observed in the region $20600-19825 \text{ cm}^{-1}$. Many "blue" luminescence bands coincide with lines at the edge of fundamental absorption. Fig.1 gives photographs of the "blue" luminescence of two thin monocrystals of CdS. A considerable difference in the spectra of these two samples can be seen in Fig.1. Fig.2 shows coincidence of the "blue" luminescence bands with the absorption bands. Change of crystal thickness was found to

Card 2/3

Luminescence of Cadmium Sulphide Crystals.   51-4 -3-10/30

produce changes in the intensities of the "blue"
luminescence bands.   The author concludes that in
luminescence of CdS crystals emission of up to six
types of spatially separated centres, related to crystal
lattice defects, may be observed. Two of these types
of centres are responsible for the "green" luminescence
and the other four for the "blue" luminescence.
Vibrational structure in each series of bands is due to
the interaction with vibrations of the lattice deformed
near an emitting centre.   The author thanks V.L. Broude
and E.I. Rashba for valuable criticisms.   There are
2 figures and 9 references, of which 3 are Soviet,
3 American, 1 Dutch, 1 French and 1 German.

ASSOCIATION: Institute of Physics, Academy of Sciences of the
Ukrainian SSR. (Institut fiziki AN USSR.)

SUBMITTED: April 26, 1957.

1. Cadmium sulfide crystals—Luminescence

Card 3/3

BROUDE, V.L.; YEREMENKO, V.V.; MEDVEDEV, V.S.

Spectra of photoconductivity excitation and luminescence of
CdS crystals. Zhur.tekh.fiz. 28 no.10:12 O '58. (MIRA 11:12)
(Cadmium sulfide crystals--Optical proporties)

24(6)   SOV/57-28-10-7/40

AUTHORS: Broude, V. L., Yeremenko, V. V. Sheynkman, M. K.

TITLE: Investigation of the Spectral Distribution of   Photocon-
              ductivity of CdS Single-Crystals at 77 and 20°K (Issledovaniye
              spektral'nogo raspredeleniya fotoprovodimosti monokristallov
              CdS pri 77 i 20°K)

ABSTRACT: This is a presentation of the results of an investigation of the
              spectral distribution of the photocurrent and of the eigentime
              of the photocarriers at 77 and 20°K, and of the relation of
              these quantities to the coefficients of light absorption for dif-
              ferent wave lengths. The four functions, that of the spectral
              distribution of the photocurrent $I_{ph}(\lambda)$, that of the eigentime
              $\tau^{o}(\lambda)$, and that of the ratio $I_{ph}(\lambda)/\tau^{o}(\lambda)$ on the one hand,

              and that of the light absorption coefficient κ at the limit of
              intrinsic absorption on the other were compared carefully. It
              appeared that no unique relation can be established between
              these quantities. Hence the dependence of the photosensitivity
Card 1/3   upon the absorption coefficient is obviously superimposed by a

$SOV/57-28-10-7/40$

Investigation of the Spectral Distribution of the Photoconductivity of CdS
Single-Crystals at 77 and 20°K

dependence upon the wavelength of the absorbed light. It re-
sults that the fine structure of the spectral distribution of
the photosensitivity at low temperatures cannot be explained
by a mechanism which is connected with the value of the ab-
sorption coefficient, with the influence of the crystal sur-
face and similar phenomena. The explanation is apparently af-
forded by a parallel action of several mechanism effective
either in the absorption of light or in the creation or annihi-
lation of photocarriers. Special notice is given to the little
pronounced structure of the spectral distribution of $\tau^0(\lambda)$ at
77°K in a range where the spectral structure of the photocurrent
is expressly evident. This may offer evidence for the fact that
it is not possible to explain the spectral structure of photo-
conductivity by a simple surface recombination of the free car-
riers. From the considerations advanced in this paper it pro-
ceeds that it is necessary to introduce a relation between the
quantities determining the photosensitivity of crystals and the
frequency of the exciting light. The experimental parameters
which are available at present are insufficient for giving a

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Investigat'   of the Spectral Distribution of the Photoconductivity of CdS   SOV/57-28-10-7/40
Single-Crystals at 77 and 20°K

unique answer to the question how such a relation should be
established. In this paper only a few possibilities can be men-
tioned. A careful confrontation of the spectral distribution of
the steady photocurrent with the absorption spectra showed the
absence of any immediate connection between photoconductivity
and the narrow absorption lines. V. Ye. Lashkarev, Member,
Academy of Sciences, UkrSSR, and A. F. Prikhot'ko, Correspond-
ing Member of the Academy of Sciences, UkrSSR, showed constant
interest in this work. E. I. Rashba discussed the work with the
authors. There are 5 figures, 2 tables, and 28 references, 16
of which are Soviet.

SUBMITTED: December 16, 1957

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24(6)
AUTHOR: Yeremenko, V.V.

SOV/57-28-10-25/40

TITLE: Spectral Distribution of Photoconductivity in Cu$_2$O Crystals
at 20°K (Spektral'noye raspredeleniye fotoprovodimosti v
kristallakh Cu$_2$O pri 20°K)

PERIODICAL: Zhurnal tekhnicheskoy fiziki, Vol 28, Nr 10, pp 2261-2263 (USSR) 1958

ABSTRACT: This is a letter to the editor presenting the results of a com-
parison of the absorption spectrum with the spectral distribution
of photoconductivity at low temperatures. This should furnish
additional information on the mechanism of the photoconductivity
of Cu$_2$O. The measurements were performed at 20°K where the dark
conductivity of the crystals is far below measuring sensitivity.
The sensitivity of the electrometric scheme made it possible to
carry out reliable measurements of the photocurrent at low in-
tensities of the monochromatic light and at a sufficiently small
electric field strength (not exceeding 3 kV/cm). The curve de-
scribing the spectral distribution of photoconductivity at 20°K
in a Cu$_2$O crystal with a thickness of about 100 μ is presented.
In order to compare this curve with the structure of the absorp-

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Spectral Distribution of Photoconductivity in   SOV/57-■-10-25/40
Cu_2O Crystals at 20°K

tion spectrum at 20°K, this spectrum was photographed of a Cu_2O crystal with a thickness of about 20 - 30μ. The diagram obtained shows that nothing directly corresponding to the narrow, so-called "exciton" lines of absorption is found in the structure of the spectral distribution of the photoeffect. In the long-wave range, where no exciton lines are found, the photoconductivity is sufficiently high. In the range of 15 000 - 17 000 cm^{-1} the curve of the spectral distribution of photoconductivity resembles the curve of continuous absorption, which in the long-wave range is connected with the dislocations in the Cu_2O lattice (Ref 8). There are 1 figure, 1 table, and 8 references, 8 of which are Soviet.

SUBMITTED: May 8, 1958

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24(6)
AUTHORS: Broude, V.L., Yeremenko, V.V.,   SOV/57-23-10-26/40
             Medvedev, V.S.

TITLE: Spectra of Photoconductivity Excitation and of Luminescence of
             CdS Crystals (Spektry vozbuzhdeniya fotoprovodimosti i lyumines-
             tsentsii kristallov CdS)

PERIODICAL: Zhurnal tekhnicheskoy fiziki, Vol 28, Nr 10, pp 2263-2265 (USSR) *1958*

ABSTRACT: In order to analyze the relation between the photoconductivity
             and the luminescence of CdS crystals a joint investigation of
             the spectra of photoconductivity excitation and of luminescence
             at 20°K was carried out. According to the experience gained the
             crystal samples could be categorized as follows: 1) First group:
             The diagrams obtained showed an approximative coincidence of the
             maxima of the curves describing the spectral distribution of
             photoconductivity and of the spectra of green luminescence.
             2) Second group: The two spectra mentioned exhibit a pronounced
             divergence. 3) Third group: This group is distinguished by an
             intense orange luminescence. The information collected leads to
             the following conclusions: 1) The photoconductivity of CdS crystals
             and the green luminescence are closely related. The excitation
             spectra of some samples coincide. 2) A divergence between the

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Spectra of Photoconductivity Excitation and of   SOV/57-28-10-26/40
Luminescence of CdS Crystals

spectral distribution of photoconductivity and the curve de-
scribing the dependence of the intensity of green luminescence
upon the wavelength of the exciting light (group 2) is, as a rule,
observed, if a sharp decline of photosensitivity occurs towards
smaller wavelengths. 3) On the strength of the fact that the two
curves in question do not agree with each other, the conclusion
is drawn that the absorption of CdS crystals is, at least in the
range of 20 600 - 20 800 cm^{-1}, of a mixed nature (Ref 3). A similar
conclusion can also be drawn for the crystals of the first group.
These samples yielded curves with coinciding peaks of the ex-
citation and of the absorption. 4) Two kinds of excitation of the
orange luminescence were discovered. This apparently indicates
that two different kinds of luminescence are in existence in this
range. Some crystals exhibit an orange luminescence accompanied
by a green luminescence, causing an absorption in the range of
20 600 - 20 700 cm^{-1}. A more detailed analysis of the results
will be presented in another paper. There are 2 figures and 3

Card 2/3   references, 3 of which are Soviet.

AUTHORS: Broude, V. L., Yeremenko, V. V.,   20-119-5-19/59
                Chikovani, N. N.

TITLE: The Structure of the Absorption and the
                Photoelectric Conductivity Spectra of CdS Crystals

                at 20°K (Struktura spektrov pogloshcheniya i
                fotoprovodimosti kristallov CdS pri 20°K)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 119, Nr 5,
                pp. 911-913 (USSR)

ABSTRACT: It was of interest to measure the coefficients of
                absorption of light by CdS crystals within the short
                wave range, as well as to estimate the changes of band
                intensities connected with the distortions of the lattice.
                In order to determine the nature of photoproduction, a
                comparison of the spectral distribution of the absorption
                coefficient with the spectral distribution of a steady
                photoelectric current was of importance. The investigation
                was carried out at 20°K and used a metal cryostat with

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The Structure of the Absorption and the   20-119-5-19/59
Photoelectric Conductivity Spectra of CdS Crystals
at 20°K

plane windows in which the sample was cooled by vapors
of boiling hydrogen. The photoconductivity was measured
in a glass monochromator with lengthened chamber $(F = 1\ m)$
produced by Messrs. Leitz. The absorption coefficient was
measured by photographic photometric measurement using a
nine-stage attenuator. The authors succeeded in carrying
out the measurement of the absorption curve up to a
frequency of 20860 cm^{-1} in the polarization of light along
the c-axis, and up to a frequency of 20680 cm^{-1} in the
strong component of the spectrum. A diagram shows the
curves of spectral distribution of the absorption
coefficient for polarized light parallel and vertical to
the optical axis of the CdS crystal at 20°K. Starting with
the frequency of 20625 cm^{-1} the light is almost completely
absorbed in a crystal of the thickness 15 - 20μ. The
absorption of the light within the range of frequencies
above 20600 cm^{-1} is sufficiently stable in various samples.

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The Structure of the Absorption and the
Photoelectric Conductivity Spectra of CdS Crystals
at 20°K.

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Within the range of long-wave narrow-band absorption
the absorption coefficient in band 10 changes a dozen
times. Within the range of strong absorption the authors
could not determine the curve $\mathcal{H}(\lambda)$, as they did not
dispose of sufficiently thin crystals. They compared,
however, the obtained absorption curves with the spectra
of thin crystals existing in references and they could
conclude the following: In the polarization of light
along the optical axis of the crystal the first peak of
photoproduction corresponds to the increase of the
absorption coefficient in that range of the spectrum where
the absorption does not change from sample to sample. The
further increase of $\mathcal{H}$ leads to a decrease of the photo-
electric current. Also the second peak of the photoelectric
current is located on the rising branch of the absorption
curve. The first maximum of the photoelectric current is
located within the range of the lines 4 - 10, and the

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The Structure of the Absorption and the   20-119-5-19/59
Photoelectric Conductivity Spectra of CdS Crystals
at 20°K

second maximum within the range of band 13. There are no
changes whatever for the c-component on the curve of
photoconductivity within the range of band 10. By proposal
of E. I. Rashba   the values of the steady photoelectric
current at various wavelengths were compared with one
another, the results of this comparison are mentioned in
a table. There is no clear coincidence between the steady
photoelectric current and the absorption coefficient of
light. This speaks in favor of the fact that the dependence
of photoconductivity on the absorption coefficient is
complicated by the explicit dependence of the photoelectric
current on the wave length of the absorbed light. Finally
the author thanks A. F. Prikhot'ko and E. I. Rashba for
their active participation in the discussion of this work.
There are 2 figures, 1 table, and 4 references, 4 of which
are Soviet.

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The Structure of the Absorption and the
Photoelectric Conductivity Spectra of CdS Crystals   20-119-5-19/59
at 20°K

ASSOCIATION: Institut fiziki Akademii nauk USSR (Institute of
                 Physics, AS Ukrainian SSR)

PRESENTED: December 6, 1957, by A. N. Terenin, Member, Academy of
                 Sciences, USSR

SUBMITTED: December 4, 1957

Card 5/5

YEREMENKO, V.V.

PHASE I BOOK EXPLOITATION SOV/3140

Akademiya nauk Ukrainskoy SSR. Institut fiziki

Fotoelektricheskiye i opticheskiye yavleniya v poluprovodnikakh;
trudy pervogo vsesoyuznogo soveshchaniya po fotoelektricheskim
i opticheskim yavleniyam v poluprovodnikakh, g. Kiyev, 20-26
noyabrya 1957 g. (Photoelectric and Optical Phenomena in Semi-
conductors; Transactions of the First Conference on Photoelectric
and Optical Phenomena in Semiconductors...) Kiyev, 1959. 403 p.
4,000 copies printed.

Additional Sponsoring Agency: Akademiya nauk SSSR. Prezidium.
Komissiya po poluprovodnikam.

Ed. of Publishing House: I. V. Kleina; Tech. Ed.: A. A. Matveychuk;
Resp. Ed.: V. Ye. Lashkarev, Academician, Ukrainian SSR, Academy
of Sciences.

PURPOSE: This book is intended for scientists in the field of semi-
conductor physics, solid state spectroscopy, and semiconductor
devices. The collection will be useful to advanced students in
universities and institutes of higher technical training
specializing in the physics and technical application of semi-
conductors.

COVERAGE: The collection contains reports and information bulletins
(the latter are indicated by asterisks) read at the First All-
Union Conference on Optical and Photo-electric Phenomena in Semi-
conductors. A wide scope of problems in semiconductor physics
and technology are considered: photoconductivity, photoelectro-
motive forces, optical properties, photoelectric cells and
phototransistors, the actions of hard and corpuscular radiation,
the properties of thin films and complex semiconductor systems,
etc. The materials were prepared for publication by M. I.
Nashboy, O. V. Snitko, K. B. Tolpygo, G. F. Lubchenko, and M. K.
Sheynkman. References and discussion follow each article.

TABLE OF CONTENTS [abridged]:

OF SEMICONDUCTORS

26.3420

S/058/62/000/005/046/119
A001/A101

AUTHORS: Broude, V. L., Yeremenko, V. V., Rashba, E. I.

TITLE: Impurity absorption and luminescence in CdS single crystals

PERIODICAL: Referativnyy zhurnal, Fizika, no. 5, 1962, 33, abstract 5V225
               (V sb."Fotoelektr. i optich. yavleniya v poluprovodnikakh",
               Kiyev, AN USSR, 1959, 43-52)

TEXT: On the basis of studying absorption spectra of CdS crystals, the
impurity origin of absorption in the region of narrow lines (20,400 - 206,000
cm^{-1}) was shown; these lines are due to electron transitions in the CdS lattice
near its dislocations. Blue luminescence of CdS is caused by light emission
from the same absorption centers to which pertain absorption lines 20,440;
20,525; 20,575 and $\sim$20,600 cm^{-1}. A hypothesis is put forth on the existence
of six types of defects.

[Abstracter's note: Complete translation]

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YEREMENKO, V.V.

82548

S/181/60/002/007/028/042
B006/B060

24.7700

AUTHORS: Yeremenko, V. V., Medvedev, V. S.

TITLE: The Dependence of Photoconductivity and Intensity of
Luminescence of Anthracene Crystals on the Wavelength
of Exciting Light

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 7, pp. 1572-1575

TEXT: The mode of the spectral distribution of photoconductivity of
anthracene single crystals is explained either by exciton diffusion ef-
fects (Ref. 1), or by free carrier diffusion (Ref. 2). Which view may be
the right one, cannot be really clarified by an investigation of photo-
conductivity alone. A clarification is possible only by a simultaneous
examination of the dependence of photoconductivity and of luminescence
intensity on the wavelength of the exciting light. This was the aim of
the work, and it was attained by comparing the diffusion lengths l in the
formula of the dependence of the photocurrent I_{ph} on the absorption coef-
ficient k of the exciting light: $I_{ph} = I_{\infty}/(1+1/kl)$, and in the formula

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The Dependence of Photoconductivity and Intensity   S/181/60/002/007/028/042
of Luminescence of Anthracene Crystals on the   B006/B060
Wavelength of Exciting Light

for the k dependence of the luminescence intensity: $I_{lum} = \beta \frac{I_o}{D} \frac{1}{\gamma} \frac{k+\gamma}{k+1/1}$;
the 1 in the former formula may denote both the diffusion length of the
excitons and that of the free carriers, while that in the latter formula
concerns the excitons only. D is the exciton diffusion coefficient,
$\gamma = (1/1)+(q/D)$, q is the radiationless annihilation rate, $\beta \leq 1$, I_o is
the intensity of the exciting light, I_{∞} is the photocurrent at $k = \infty$.
The form of the spectra was found to be greatly dependent on the surface
state of the specimen; I_{ph} and I_{lum} were therefore measured on the same
crystal: the former with a tube electrometer (sensitivity $5 \cdot 10^{-15}$ a), the
latter with a photoelectronic multiplier of the type ФЭУ-19 (FEU-19).
Fig. 1 shows the measured frequency dependence of the luminescence intensi-
ty (empty circles) and of the photocurrent (full circles); the spectral
distribution of the dimensionless absorption coefficient for unpolarized
light in the anthracene crystal is also included in the figure for a com-
parison. Maxima of the absorption coefficient correspond to maxima in the
photocurrent distribution and minima in the luminescence spectrum. Fig. 2

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The Dependence of Photoconductivity and Intensity   S/181/60/002/007/028/042
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shows the luminescence intensity as a function of the absorption coeffi-
cient, and Fig. 3 the photocurrent as a function thereof. The exciton dif-
fusion length l and q/D can be determined by the experiments; the values
obtained experimentally are in good agreement with the theoretical values
$l = 0.2 \cdot 10^{-4}$ cm and $q/D = 2.10^{5}$ cm^{-1}. A calculation of the diffusion length
based on the dependence of luminescence quantum yield and of the photo-
current on the absorption coefficient yields very similar values, and it
may be concluded therefrom that the form of the spectral distribution of
photoconductivity is characterized by the diffusion of excitons (and not
of free carriers) to the surface of the molecular crystal. There are 3
figures and 7 references: 3 Soviet, 2 US, and 1 British.

ASSOCIATION: Institut fiziki AN USSR Kiyev
                 (Institute of Physics of the AS UkrSSR, Kiyev)

SUBMITTED: December 14, 1959

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38028 R
S/181/60/002/010/040/051
B104/B205

9.4160

26.9480

AUTHOR: Yeremenko, V. V.

TITLE: Study of the spectral dependence of photoconductivity of
            CdSe single crystals at 77 and 20°K

PERIODICAL: Fizika tverdogo tela, v. 2, no. 10, 1960, 2596 - 2601

TEXT: The spectral dependence of the photoconductivity of a great number
of CdSe single crystals has been studied at $T = 77°K$ and $T = 20°K$ and
compared with the absorption spectrum at 20°K. Measurements were made
with uniform illumination of all specimens. The electrodes were obtained
by melting of indium onto the surfaces of the crystals. All measurements
were made at electric field strengths not higher than 200 v/cm in order to
eliminate the effect of the electric field on the spectral distribution of
photoconductivity. The optical axes of all single crystals studied were
parallel to their fully developed faces. Photoconductivity was excited by
polarized monochromatic light. The electric vector was parallel or perpen-
dicular to the optical axis of the crystal. The spectral dependence of
the photocurrent determined experimentally by using the above-mentioned

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Study of the spectral...

single crystals varied greatly. The single crystals could be divided into three groups, according to the kind of spectral dependence of the photo-current. Fig. 1 shows curves for the spectral distribution of photocon-ductivity of the three groups. Lowering the temperature from 77 to $20^{\circ}K$ did not result in a shift of the entire curve in the frequency scale, or in a decrease of the absolute photoconductivity. Nevertheless, the rela-tive values of the spectral maxima of the photocurrent changed. Cooling the specimens from 77 to $20^{\circ}K$ caused all spectral maxima to shift toward higher frequencies. As these shifts varied, the intervals between the maxima also changed. The decrease of temperature increased the frequency of the photocurrent minima by 160 cm^{-1} but did not change the intervals between the minima. The spectral maxima and minima of the photocurrent differed by 20 - 25 cm^{-1} for the various specimens. As the differences between the various positions are smaller than the intervals between the maxima, the latter could be clearly identified. It is shown that the pe-culiarities of the spectral distribution of the photocurrent described here cannot be explained by the phenomenological theory. Next, the rela-tionship between the spectral dependence of photoconductivity and that of the absorption coefficient is studied, and the different values obtained

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                                            B104/B205

for the photocurrent at different wavelengths but equal absorptive capac-
ity for the exciting light are intercompared. Fig. 3 indicates that
photo-carriers are produced as a result of interaction of excitons with
CdSe lattice defects only if the formation of bands has an exciton charac-
ter. Such carriers may also be obtained by thermal ionization of the ex-
cited local centers by light. The author thanks V. L. Broude for discus-
sions, and A. P. Galushke for assistance in measurements. There are
3 figures, 3 tables, and 12 references: 9 Soviet-bloc and 3 non-Soviet-
bloc. The references to English-language publications read as follows:
De-Vore, Phys. Rev., 102, 86, 1956; R. H. Bube, J. Chem. Phys., 21, 1409,
1953.

ASSOCIATION: Institut fiziki AN USSR Kiyev (Institute of Physics, AS
             UkSSR, Kiyev)

SUBMITTED: February 23, 1960

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9,4177

AUTHOR: Yeremenko, V. V.

TITLE: Investigation of the Spectral Distribution of the Photo-
             conductivity of CdS$_x$·CdSe$_{1-x}$ Compound Single Crystals at
             77 and 20°K

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 10, pp. 2602 - 2605

TEXT: The samples investigated were bred according to the method by
N. I. Vitrikhovskiy and I. B. Mizetskaya (Ref.7) by N. I. Vitrikhovskiy.
The author gives results of the investigation of photoconductivity and
of the absorption spectra of the compound single crystals mentioned in
the title. Fig. 1 shows spectral distributions of photoconductivity at
77°K for four compound crystals which are different with respect to
their composition. It is found that these curves do not exactly corre-
spond with all samples of equal composition. Fig. 2 shows a comparison
of the spectral distribution of photoconductivity at 20 and 77°K. It is
found that the spectral dependence of photoconductivity cannot be ex-
plained within the framework of a simple phenomenological theory, for

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Investigation of the Spectral Distribution of
the Photoconductivity of CdS$_x$·CdSe$_{1-x}$
Compound Single Crystals at 77 and 20°K

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B019/B056

within the shortwave range an increase of photoconductivity could be
proven, which is in contradiction to the phenomenological theory. The
results obtained by an investigation of the absorption spectra are given
in Fig. 3. It is shown that the "edge" luminescence occurring in pure
CdS- and CdSe-single crystals could not be proved to exist in the com-
pound crystals. An increase of CdSe concentration by 1% leads (both at
77°K and at 20°K) to a shift of the maximum of photoconductivity and of
the absorption edge in the direction of the longwave side of the spec-
trum by 60 cm^{-1}. A comparison of the concentration shift of the absorp-
tion edge of CdS with that of the temperature shift shows that the lat-
ter, at not very low temperatures, changes only to a small degree on
change in atomic distances. The temperature shift of the absorption
bands must be explained by the change in lattice parameters. There are
4 figures and 14 references: 7 Soviet, 6 German, and 1 US.

ASSOCIATION: Institut fiziki AN USSR g. Kiyev (Institute of Physics
of the AS UkrSSR, Kiyev)

SUBMITTED: February 27, 1960

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84686

S/051/60/009/005/007/019
E201/E191

26.2420

AUTHORS: Yeremenko, V.V., and Chuyko, L.I.

TITLE: The Effect of Deformation on the Absorption Spectrum of Cuprous Oxide Crystals at 20 °K

PERIODICAL: Optika i spektroskopiya, 1960, Vol.9, No.5, pp 621-625

TEXT: At low temperatures Cu_2O crystals exhibit two series of converging absorption bands, one of which is green and the other yellow. The origin of these two series is not clear. According to some workers (Ref. 3) the green series is due to a combination of lattice vibrations with transitions from a valence band common to both series. Others suggest that the two series are due to transitions from different valence bands (Refs 7, 8). In order to decide between these two viewpoints, the authors studied the effect of compression and electric fields on the bands of the two series. Cuprous oxide crystals were compressed at 20 °K using a press with transparent plungers (Ref. 9) and a metal cryostat with quartz windows (Ref. 10). To find the effect of uniform electric fields at 20 °K the samples were immersed directly in liquid hydrogen. Absorption spectra were recorded using a Shteynkhel'-type spectrograph with a linear dispersion of 12 Å/mm at 5000 Å.
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